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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,876	04/05/2004	Xu Zhou	95-539	2646

20736 7590 02/13/2007
MANELLI DENISON & SELTER
2000 M STREET NW SUITE 700
WASHINGTON, DC 20036-3307

EXAMINER	
TORRES, JUAN A	
ART UNIT	PAPER NUMBER
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/816,876	ZHOU ET AL.	
	Examiner	Art Unit	
	Juan A. Torres	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 May 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05-26-2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 05/26/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "S(n)" "S(n+1)" "S(n+2)" "S(n+3)" (see page 6 lines 31 and 33 and page 7 lines2 and 3). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities:

a) The recitation in page 1 lines 17 and 21; page 3 lines 31 and 32; page 4 lines 9 and 15; page 5 line 35 and page 6 lines 13, 16 and 21 "IEEE 802.11" seems to be

improper, because is making reference to the OFDM version of the IEEE802.11 standard that is the IEEE 802.11a standard; the IEEE 802.11 standard only discloses the Frequency Hopping Spread Spectrum (FHSS) (section 14 pages 148-194 of the IEEE 802.11 standard); the Direct Sequence Spread Spectrum (DSSS) (section 15 pages 195-223 of the IEEE 802.11 standard); and the Infrared (IR) (section 16 pages 224-240 of the IEEE 802.11 standard) versions of the standards; it is suggested to be changed to "IEEE 802.11a".

b) The recitation in page 6 lines 32 and 34; and page 7 line 2 "t1" is improper (see figure 1 and page 8 line 10); it is suggested to be changed to "t_1".

c) The recitation in page 6 lines 32 and 35 "t2" is improper (see figure 1 and page 8 line 10); it is suggested to be changed to "t_2".

d) The recitation in page 6 line 35; and page 7 line 1 "t3" is improper (see figure 1 and page 8 line 10); it is suggested to be changed to "t_3".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Moose (US 20020065047 A1).

As per claim 1, Moose discloses receiving OFDM symbols, including an initial minimum number of short preamble symbols (figure 4 paragraphs [0027]-[0030], [0054] and [0113]); first generating autocorrelated signal values based on samples from consecutive OFDM symbols (figure 4 block 401 paragraphs [0027]-[0030], [0054] and [0113]); second generating a median autocorrelation value from at least a prescribed minimum number of the autocorrelated signal values having been generated from the initial minimum number of short preamble symbols (figure 4 block 401 paragraphs [0027]-[0030], [0054] and [0113]); and detecting a symbol boundary, identifying an end of the short preamble symbols, based on detecting the autocorrelated signal values having passed below a threshold that is based on the median autocorrelation value (figure 5 paragraphs [0044] and [0058]).

As per claim 2, Moose discloses claim 1, Moose also discloses that the each of the short preamble symbols have sixteen (16) samples, the step of first generating each autocorrelated signal value includes autocorrelating thirty- two (32) adjacent samples, and outputting a power value as the corresponding autocorrelated signal value (figure 4 paragraphs [0024]-[0025] and [0054]).

As per claim 3, Moose discloses claim 1, Moose also discloses storing at least the prescribed minimum number of the autocorrelated signal values in a buffer (figure 4 block 405 paragraph [0066]. The integrator inherently need o store the data to be able to integrate the data, providing the medium value in the integrated time); determining a median of the stored autocorrelated signal values as the median autocorrelation value

(figure 4 block 405 paragraph [0066]. The integrator inherently need o store the data to be able to integrate the data, providing the medium value in the integrated time).

As per claim 4, Moose discloses claim 3, Moose also discloses generating the threshold by multiplying the median autocorrelation value by a prescribed constant value (figure 5 paragraphs [0044] and [0058]. In the case of figure 5 the threshold is half the integrated value).

As per claim 5, Moose discloses claim 4, Moose also discloses supplying the threshold and the autocorrelated signal values to a comparator, the comparator outputting a detection signal representing detection of the symbol boundary in response to the autocorrelated signal values passing below the threshold (figure 5 paragraphs [0044] and [0058]. In the case of figure 5 the threshold is half the integrated value).

As per claim 6, Moose discloses a correlator configured for receiving OFDM symbols, including an initial minimum number of short preamble symbols, and generating autocorrelated signal values based on samples from consecutive OFDM symbols (figure 4 block 401 paragraphs [0027]-[0030], [0054] and [0113]); a median filter configured for generating a median autocorrelation value from at least a prescribed minimum number of the autocorrelated signal values having been generated from the initial minimum number of short preamble symbols (figure 4 block 401 paragraphs [0027]-[0030], [0054] and [0113]); and a detector configured for detecting a symbol boundary, identifying an end of the short preamble symbols, based on detecting the autocorrelated signal values having passed below a threshold that is based on the median autocorrelation value (figure 5 paragraphs [0044] and [0058]).

As per claim 7, Moose discloses claim 6, Moose also discloses that each of the short preamble symbols have sixteen (16) samples, the correlator configured for generating each autocorrelated signal value by autocorrelating thirty-two (32) adjacent samples, and outputting a power value as the corresponding autocorrelated signal value (figure 4 paragraphs [0024]-[0025] and [0054]).

As per claim 8, Moose discloses claim 6, Moose also discloses a buffer configured for storing at least the prescribed minimum number of the autocorrelated signal values (figure 4 block 405 paragraph [0066]. The integrator inherently need o store the data to be able to integrate the data, providing the medium value in the integrated time); and a median calculator configured for determining a median of the stored autocorrelated signal values as the median autocorrelation value (figure 4 block 405 paragraph [0066]. The integrator inherently need o store the data to be able to integrate the data, providing the medium value in the integrated time).

As per claim 9, Moose discloses claim 8, Moose also discloses generating the threshold by multiplying the median autocorrelation value by a prescribed constant value (figure 5 paragraphs [0044] and [0058]. In the case of figure 5 the threshold is half the integrated value).

As per claim 10, Moose discloses claim 9, Moose also discloses a comparator configured for outputting a detection signal, representing detection of the symbol boundary, in response to the autocorrelated signal values passing below the threshold (figure 5 paragraphs [0044] and [0058]. In the case of figure 5 the threshold is half the integrated value).

Claims 1-10 are rejected under 35 U.S.C. 102(a) as being anticipated by Wang ("FPGA implementation of an OFDM-WLAN synchronizer", Second IEEE International Workshop on Electronic Design, Test and Applications, 2004. DELTA 2004, 28-30 Jan. 2004, Page(s): 89 - 94).

As per claim 1, Wang discloses receiving OFDM symbols, including an initial minimum number of short preamble symbols (abstract and sections I [last two paragraphs] and III figure 1); first generating autocorrelated signal values based on samples from consecutive OFDM symbols (abstract and sections I [last two paragraphs] and III figure 1); second generating a median autocorrelation value from at least a prescribed minimum number of the autocorrelated signal values having been generated from the initial minimum number of short preamble symbols (abstract and sections I [last two paragraphs] and III figure 1); and detecting a symbol boundary, identifying an end of the short preamble symbols, based on detecting the autocorrelated signal values having passed below a threshold that is based on the median autocorrelation value (figures 3 and 4 section IV).

As per claim 2, Wang discloses claim 1, Wang also discloses that the each of the short preamble symbols have sixteen (16) samples, the step of first generating each autocorrelated signal value includes autocorrelating thirty- two (32) adjacent samples, and outputting a power value as the corresponding autocorrelated signal value (abstract and sections I [last two paragraphs] and III figure 1).

As per claim 3, Wang discloses claim 1, Wang also discloses storing at least the prescribed minimum number of the autocorrelated signal values in a buffer (abstract

and sections I [last two paragraphs] and III figure 1); determining a median of the stored autocorrelated signal values as the median autocorrelation value (abstract and sections I [last two paragraphs] and III figure 1).

As per claim 4, Wang discloses claim 3, Wang also discloses generating the threshold by multiplying the median autocorrelation value by a prescribed constant value (figure 4 section IV in the case of figure 4 is 0.75).

As per claim 5, Wang discloses claim 4, Wang also discloses supplying the threshold and the autocorrelated signal values to a comparator, the comparator outputting a detection signal representing detection of the symbol boundary in response to the autocorrelated signal values passing below the threshold (abstract and sections I [last two paragraphs] and III figure 1).

As per claim 6, Wang discloses a correlator configured for receiving OFDM symbols, including an initial minimum number of short preamble symbols, and generating autocorrelated signal values based on samples from consecutive OFDM symbols (abstract and sections I [last two paragraphs] and III figure 1); a median filter configured for generating a median autocorrelation value from at least a prescribed minimum number of the autocorrelated signal values having been generated from the initial minimum number of short preamble symbols (abstract and sections I [last two paragraphs] and III figure 1); and a detector configured for detecting a symbol boundary, identifying an end of the short preamble symbols, based on detecting the autocorrelated signal values having passed below a threshold that is based on the median autocorrelation value (figures 3 and 4 section IV).

As per claim 7, Wang discloses claim 6, Wang also discloses each of the short preamble symbols have sixteen (16) samples, the correlator configured for generating each autocorrelated signal value by autocorrelating thirty-two (32) adjacent samples, and outputting a power value as the corresponding autocorrelated signal value (abstract and sections I [last two paragraphs] and III figure 1).

As per claim 8, Wang discloses claim 6, Wang also discloses a buffer configured for storing at least the prescribed minimum number of the autocorrelated signal values (abstract and sections I [last two paragraphs] and III figure 1); and a median calculator configured for determining a median of the stored autocorrelated signal values as the median autocorrelation value (abstract and sections I [last two paragraphs] and III figure 1).

As per claim 9, Wang discloses claim 8, Wang also discloses generating the threshold by multiplying the median autocorrelation value by a prescribed constant value (figure 4 section IV in the case of figure 4 is 0.75).

As per claim 10, Wang discloses claim 9, Wang also discloses a comparator configured for outputting a detection signal, representing detection of the symbol boundary, in response to the autocorrelated signal values passing below the threshold (abstract and sections I [last two paragraphs] and III figure 1).

Claims 1-10 are rejected under 35 U.S.C. 102(a) as being anticipated by Golanbari (US 7054393 B2).

As per claim 1, Golanbari discloses receiving OFDM symbols, including an initial minimum number of short preamble symbols (abstract figure 5 block 503 column 5 lines

53-65); first generating autocorrelated signal values based on samples from consecutive OFDM symbols (abstract figure 5 block 509 column 6 lines 15-25); second generating a median autocorrelation value from at least a prescribed minimum number of the autocorrelated signal values having been generated from the initial minimum number of short preamble symbols (abstract figure 5 block 512 column 6 lines 15-41); and detecting a symbol boundary, identifying an end of the short preamble symbols, based on detecting the autocorrelated signal values having passed below a threshold that is based on the median autocorrelation value (abstract figure 5 block 518 column 6 lines 42-52).

As per claim 2, Golanbari discloses claim 1, Golanbari also discloses that each of the short preamble symbols have sixteen (16) samples, the step of first generating each autocorrelated signal value includes autocorrelating thirty- two (32) adjacent samples, and outputting a power value as the corresponding autocorrelated signal value (abstract figure 5 column 5 lines 53-65 and column 6 lines 15-25).

As per claim 3, Golanbari discloses claim 1, Golanbari also discloses storing at least the prescribed minimum number of the autocorrelated signal values in a buffer (abstract figure 5 block 512 column 6 lines 15-41); determining a median of the stored autocorrelated signal values as the median autocorrelation value (abstract figure 5 block 512 column 6 lines 15-41).

As per claim 4, Golanbari discloses claim 3, Golanbari also discloses generating the threshold by multiplying the median autocorrelation value by a prescribed constant value (abstract figure 5 block 512 column 6 lines 15-41).

As per claim 5, Golanbari discloses claim 4, Golanbari also discloses supplying the threshold and the autocorrelated signal values to a comparator, the comparator outputting a detection signal representing detection of the symbol boundary in response to the autocorrelated signal values passing below the threshold (abstract figure 5 block 518 column 6 lines 42-52).

As per claim 6, Golanbari discloses a correlator configured for receiving OFDM symbols, including an initial minimum number of short preamble symbols, and generating autocorrelated signal values based on samples from consecutive OFDM symbols (abstract figure 5 block 509 column 6 lines 15-25); a median filter configured for generating a median autocorrelation value from at least a prescribed minimum number of the autocorrelated signal values having been generated from the initial minimum number of short preamble symbols (abstract figure 5 block 512 column 6 lines 15-41); and a detector configured for detecting a symbol boundary, identifying an end of the short preamble symbols, based on detecting the autocorrelated signal values having passed below a threshold that is based on the median autocorrelation value (abstract figure 5 block 518 column 6 lines 42-52).

As per claim 7, Golanbari discloses claim 6, Golanbari also discloses each of the short preamble symbols have sixteen (16) samples, the correlator configured for generating each autocorrelated signal value by autocorrelating thirty-two (32) adjacent samples, and outputting a power value as the corresponding autocorrelated signal value (abstract figure 5 column 5 lines 53-65 and column 6 lines 15-25).

As per claim 8, Golanbari discloses claim 6, Golanbari also discloses a buffer configured for storing at least the prescribed minimum number of the autocorrelated signal values (abstract figure 5 block 512 column 6 lines 15-41); and a median calculator configured for determining a median of the stored autocorrelated signal values as the median autocorrelation value (abstract figure 5 block 512 column 6 lines 15-41).

As per claim 9, Golanbari discloses claim 8, Golanbari also discloses generating the threshold by multiplying the median autocorrelation value by a prescribed constant value (abstract figure 5 block 512 column 6 lines 15-41).

As per claim 10, Golanbari discloses claim 9, Golanbari also discloses a comparator configured for outputting a detection signal, representing detection of the symbol boundary, in response to the autocorrelated signal values passing below the threshold (abstract figure 5 block 518 column 6 lines 42-52).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Huang (US 5991289 A) discloses obtaining symbol, frame, and carrier synchronization for guard interval-based OFDM signals. Gummadi (US 20030099314 A1) discloses detecting the occurrence of a boundary between sequences in a digital sample stream through correlating a received sample value with a plurality of previously received sample values from the same digital sample stream. Wakamatsu (US 20040052319 A1) discloses timing generation applied to a wireless communication system for receiving a radio signal which is modulated by an orthogonal

frequency division multiplexing (OFDM) modulation method and includes a burst signal including a preamble signal at the header of this modulated packet signal. Troya (US 20060146962 A1) discloses detection of the reception of a data frame in an input signal, said data frame comprising periodically repeated symbols at the beginning that also teaches the claimed limitations in figure 10. Applicants Admitted Prior art (AAPA) in copending application Serial Number 10/768073, submitted with the IDS filed on 05/26/2004 discloses that each of the short preamble symbols have sixteen (16) samples, the step of first generating each autocorrelated signal value includes autocorrelating thirty- two (32) adjacent samples, and outputting a power value as the corresponding autocorrelated signal value (see figures 1 and 2 page 2 lines 8-32).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is 571-272-3119. The examiner can normally be reached on 8-6 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juan Alberto Torres
01-30-2007